

REMARKS

I. Claim Status

Claims 1-68, 73-130, 132, 133 and 137 have been withdrawn. Claims 136 and 138-139 have been cancelled. Claims 69 and 145 have been amended to specify that element (d) is a data storage system in which data corresponding to detected reaction product detected by detection system (c) is recorded. No new matter has been introduced by the subject amendments. Claims 69-72, 131, 134-135 are therefore pending. All of the pending claims are readable on the elected species.

Applicants' attorney thanks the Examiner for withdrawal of the rejections in view of the Hale et al. and Hu et al. references.

II. Specification

The Specification has been objected to because it contains embedded hyperlinks and/or other form of browser-executable code. The Specification has been amended to remove the embedded hyperlinks/browser-executable code. Withdrawal of this objection is respectfully requested.

III. Rejection under 35 U.S.C. § 112, second paragraph

Claims 69-72, 131, 134, 135 and 140-160 stand rejected under 35 U.S.C. § 112, second paragraph in view of the phrase "reaction product from reactions catalyzed" in element (d) of independent claims 69 and 145. This rejection is respectfully traversed.

The Office Action suggests that the phrase "reaction product from reactions catalyzed" in element (d) and the phrase "from a reaction catalyzed" in element (c) are inconsistent in independent claims 69 and 145. Element (c) refers to a detection system that is capable of detecting a reaction product from a reaction catalyzed by each of the enzymes in the plurality of enzymes. Element (d) in each of claims 69 and 145 has been amended to refer to a data storage system in which data corresponding to detected reaction product detected by the detection system of element (c) is recorded. It is believed that these claims and their dependent claims are clear and definite. Accordingly, withdrawal of this rejection is respectfully requested.

IV. Rejection under 35 U.S.C. § 102 and 35 U.S.C. § 103

Claims 69-72, 131, 134, 140, 145-150 and 152 stand rejected under 35 U.S.C. § 102(b), or in the alternative, under 35 U.S.C. § 103(a) as obvious over Barrett et al. Claims 69-72, 131, 134, 135, 140-145, and 157-160 stand rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Keen (U.S. Pat. No. 6,060,327). These rejections are respectfully traversed.

The Barrett et al. patent describes methods and compositions that utilize immobilized caged binding moieties having removable chemical protecting groups to immobilize anti-ligands to select activated regions on a surface. As mentioned in Applicants' previous response, the Keen patent describes a sensor for sensing the presence of an analyte component that has a plurality of molecular recognition headgroups having affinity for the analyte component attached to a conductive polymer.

In contrast to independent claim 69, neither Barrett et al. nor Keen describe, *inter alia*, a biosensor comprising a plurality of enzymes "wherein the plurality of enzymes comprises an artificial enzyme variant of a naturally occurring enzyme, wherein the artificial enzyme variant exhibits enhanced stability relative to the naturally occurring enzyme." With regards to independent claim 145, Barrett et al. and Keen both fail to describe, *inter alia*, a biosensor comprising a plurality of enzymes "wherein the plurality of enzymes comprises an artificial enzyme variant of a naturally occurring enzyme, wherein the artificial enzyme variant comprises a non-naturally occurring catalytic specificity."

The Office Action points to passages in the Barrett et al. patent that describe what the anti-ligand can be. Those passages (col. 4, lines 34-60; col. 19, line 60 through col. 20, line 20) provide a laundry list of compounds, including a generic reference to "enzymes". The Office Action also points to passages in the Keen patent that refer to "a plurality of recognition headgroups" in which the headgroups can be enzymes such as lipases and oxidoreductases and enzymes from combinatorial and commercial libraries. (col. 7, line 44 through col. 8, line 28; col. 26, lines 5-26) The Examiner appears to have taken the position that these disclosures in the Barrett et al. and Keen patents inherently disclose the element of an artificial enzyme variant that exhibits enhanced stability or an artificial enzyme variant comprising a non-naturally occurring catalytic specificity as claimed in independent claims 69 and 145.

To support an anticipation rejection based on inherency, however, factual and technical grounds establishing that the inherent feature necessarily flows from the teachings of the prior art must be provided. Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990) In this respect, the Barrett et al. patent's generic reference to "enzymes" is far too deficient in detail for one to make any conclusion as to what features of "enzymes" are being taught. Therefore, the claimed features of enhanced stability and non-naturally occurring catalytic specificity do not necessarily flow from the teaching of the Barrett et al. patent. Moreover, Barrett et al.'s disclosure of the genus of "enzymes" does not anticipate the claimed sub-genera of artificial enzyme variants having either enhanced stability or a non-naturally occurring catalytic specificity because one of ordinary skill would not immediately envisage the claimed sub-genera from the disclosed genus. In view of these deficiencies, the Barrett et al. patent cannot be found to anticipate the above-identified claims.

With respect to the Keen patent, the disclosure of a class of enzymes only provides information on the type of activity of the enzyme. The Keen patent is void of any details as to other properties of the enzymes. Similarly, disclosure that the enzymes can be from combinatorial and commercial libraries has no bearing on the properties of the enzymes. The features of enhanced stability and a non-natural specificity do not necessarily flow from the teaching of Keen. Therefore, the Keen patent cannot be found to anticipate the above-identified claims.

In the alternative, the Examiner alleges that the artificial enzyme variant features of enhanced stability relative to the naturally occurring enzyme and non-naturally occurring catalytic specificity are obvious variations of the teachings of the Barrett et al. and Keen patents. With regards to their disclosure on enzymes, the description provided in these patents is far too generic for one of ordinary skill in the art to glean any insight as to what particular properties of an artificial enzyme might be desirable in a biosensor. There is no disclosure in either the Barrett et al. or Keen patents that would have motivated one of ordinary skill in the art to choose an artificial enzyme variant of a naturally occurring enzyme having the properties of either enhanced stability relative to the naturally occurring enzyme or a non-naturally occurring catalytic specificity for use in the claimed biosensor. Some suggestion to select the claimed sub-genera of enzymes must be taught by the prior art. See e.g., In re Baird, 29 U.S.P.Q.2d 1550, 1552. It is respectfully submitted that a *prima facie* case of obviousness has not been made.

Accordingly, withdrawal of the anticipation and obviousness rejections of the above-identified claims is respectfully requested.

In view of the amendments and remarks provided above, it is respectfully submitted that the pending claims are in condition for allowance and notification to that effect is respectfully requested. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set forth below. The Commissioner is hereby authorized to charge any deficiency in fees or credit any overpayment in connection with this submission to Deposit Account No. 50-0990.

Respectfully submitted,

April 25, 2007

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